

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
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## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year) <b>19 AUG 2005</b>	
Applicant's or agent's file reference  UPN-4426	<b>FOR FURTHER ACTION</b> See paragraph 2 below
International application No.  PCT/US05/00793	International filing date (day/month/year)  11 January 2005 (11.01.2005)
Priority date (day/month/year)  12 January 2004 (12.01.2004)	
International Patent Classification (IPC) or both national classification and IPC  IPC(7): C12N 5/02; A01N 63/00 and US Cl.: 435/375, 377; 424/93.7	
Applicant  THE TRUSTEES OF THE UNIVERSITY OF PENNSYLVANIA	

**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I      Basis of the opinion
- ☐ Box No. II      Priority
- ☐ Box No. III      Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV      Lack of unity of invention
- ☒ Box No. V      Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI      Certain documents cited
- ☐ Box No. VII      Certain defects in the international application
- ☐ Box No. VIII      Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Sumesh Kaushal Ph.D. Telephone No. (571) 272-0547
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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US05/00793

**Box No. I Basis of this opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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International application No.  
PCT/US05/00793

**Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims <u>24-25</u>	YES
	Claims <u>1-23</u>	NO
Inventive step (IS)	Claims <u>24-25</u>	YES
	Claims <u>1-23</u>	NO
Industrial applicability (IA)	Claims <u>1-25</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Claims 1-6 and 16-21 lacks novelty under PCT Article 33(2) as being anticipated by Zhuang et al (Biochem. Biophys. Res. Comm. 237:225-229, 1997). Regarding claims 1-6 the cited art teaches a method of up regulating TGF - $\beta$ 1 mRNA in osteoblastic cells by electric field-induced proliferation of osteoblastic MC3T3-E1 cells (page 225 abstract, col.2 para 2, page 226, fig-1 and 2, col.1 para.3). Regarding claims 16-21 the cited art teaches a device that is capable of providing a signal having a sine wave configuration that generate an electric field having an amplitude of about 20mV/cm at 60 kHz (page 225 col.2 para 2). Thus the cited art anticipate the invention as claimed.

Claims 1-23 lacks novelty under PCT Article 33(2) as being anticipated by Brighton et al (US 2003/0211084, 2003). Regarding claims 1-6 the cited art teaches a method of up regulating TGF - $\beta$ 1 mRNA in bone cells by electric field-induced proliferation of MC3T3-E1 cells (page 2, para. 0011, page 7 example-5). Regarding claims 7-15 the cited art teaches a method of treating fractures, bone defects or osteoporosis by electric field-induced stimulation of bone cells by providing signal having a sine wave configuration that generate an electric field having an amplitude of about 20mV/cm at 60 kHz (page 7, example-6, example-7). Regarding claims 16-23 the cited art teaches a device that is capable of providing a signal having a sine wave configuration that generate an electric field having an amplitude of about 20mV/cm at 60 kHz (page 7, example-5). Thus the cited art anticipate the invention as claimed.